a diamond-like carbon coating superposed and adhered to at least a portion of the structured surface of the hardened binder coating.

REMARKS

Claims 1 and 20 have been amended. Support for the amendment to claims 1 and 20 may be found in claims 19 and 32. Claims 19 and 32 have been cancelled.

Claims 1-18 and 19-31 stand rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,5707,409 (Martin et al.).

Martin et al. reports abrasive articles having a diamond-like coating and methods for making said abrasive articles. The abrasive articles of Martin et al. include abrasive particles adhered to a make coating (see, FIGS. 1-3) or dispersed throughout a slurry coating (see, FIG. 4). Martin et al. does not teach or suggest Applicants' claimed abrasive articles comprising:

> a backing having a first major surface and a second major surface; and
>
> an abrasive coating that is free of abrasive particles, said abrasive coating consisting essentially of:
>
> > a hardened binder coating having a first surface adhered to the backing and a second structured surface comprising a plurality of precisely-shaped protrusions; and
> >
> > a diamond-like carbon coating superposed and adhered to at least a portion of the structured surface of the hardened binder coating.

Furthermore, Martin et al. does not teach or suggest Applicants' claimed method of treating a rigid disk or rigid disk substrate using an abrasive article as described above. Abrasive articles of the present invention provide advantage, for example, in mechanically treating rigid disk or rigid disk substrates according to the method of the

present invention since they do not contaminate the treated substrate with loose abrasive particles that may become embedded in the surface of the rigid disk substrates. Such contamination may cause damage to the sensitive heads used in modern disk drives and/or may result in quality problems with the resulting memory disk. The abrasive articles of Martin et al. include abrasive particles which could potentially contaminate the treated substrate.

For a prior art reference to anticipate, every element of the claimed invention must be identically shown in a single reference. Since Martin et al. does not teach an abrasive article having an abrasive coating free of abrasive particles the rejection under 35 U.S.C. §102(b) is not proper and should be withdrawn.

Claims 1-32 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Stoetzel (U.S. Patent No. 5,928,394) in view of Martin et al. (U.S. Patent No. 5,707,409).

The Office Action states at paragraph 3 that:

> "Stoetzel discloses all of the limitations of claims 1 and 20, i.e., an abrasive article (10) comprising a backing (11) an abrasive coating consisting essentially of a hardened binder comprising a plurality of precisely-shaped protrusions (14) (fee of abrasives, col. 6, lines 14-17), except for disclosing the diamond-like carbon coating. Martin et al. teaches an abrasive article having a diamond-like coating layer (48). It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the article of Stoetzel with diamond-like coating as taught by Martin et al. to improve cutting performance, depending upon workpiece parameters.
>
> Regarding claims 2-19 and 21-32, prior art meets the limitations."

Applicants cannot agree with the position taken in the Office Action. There is simply no suggestion in the prior art to modify Stoetzel et al. with diamond-like coating of Martin et al. in order to provide an abrasive article having an abrasive coating that is

free of abrasive particles and that includes a diamond-like carbon coating. The Office Action states that "It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the article of Stoetzel with diamond-like coating as taught by Marin et al. to improve cutting performance." Here, however, the advantage of the claimed abrasive articles and methods is not in directed to abrasive cutting performance, but rather, the advantage lies in providing an abrasive article that can be used to mechanically treat (i.e., abrade) a substrate without the possibility of contaminating the substrate with abrasive particles dislodged from the abrasive article during the treating process. The property of abrasive cutting performance would, in fact, be reduced by removing the abrasive particles. Stoetzel et al. reports at col 6, lines 16-19 that "[a]n abrasive article used in a surface modification process having significant abrading action (high stock removal) typically will have an abrasive coating with abrasive particles of relatively large size."

Stoetzel et al. does not teach or suggest removing the abrasive particles in order to provide an abrasive article that will not contaminate a substrate with abrasive particles. Rather, Stoetzel reports that the abrasive particles may be removed for abrading soft workpieces (see, col 8, lines 1-21). There is no teaching or suggestion of applying a diamond-like carbon coating over the article after removal of the abrasive particles.

Martin et al. reports abrasive articles having abrasive particles and a diamond-like coating and methods for making said abrasive articles. Martin et al. does not teach or suggest removing the abrasive particles from the abrasive article. Rather, a reading of Martin et al. would teach one of skill in the art that diamond-like coatings are useful in combination with abrasive particles to provide an abrasive coating.

Taken alone or in combination there is simply no motivation to combine and the teachings of the references as suggested in the Office Action. Accordingly, the

rejection under 35 U.S.C. 103(a) as being unpatentable over Stoetzel et al. in view of Martin et al. is improper and should be withdrawn.

In view of the above, it is submitted that the application is in condition for allowance. Allowance of claims 1-18, 20-31 at an early date is respectfully requested.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

1 (twice amended). A method of mechanically treating a substrate, the method comprising the steps of:

(a) providing a substrate for mechanical treatment, the substrate selected from the group consisting of a rigid disk or a rigid disk substrate;

(b) providing an abrasive article in contact with the substrate at a pressure, the abrasive article comprising:

a backing having a first major surface and a second major surface; and

an abrasive coating that is free of abrasive particles, said abrasive coating consisting essentially of:

a hardened binder coating having a first surface adhered to the backing and a second structured surface comprising a plurality of precisely-shaped protrusions; and

a diamond-like carbon coating superposed and adhered to at least a portion of the structured surface of the hardened binder coating; and

(c) moving at least one of the substrate and the abrasive article relative to the other to provide the mechanical treatment.

20 (twice amended). An abrasive article comprising:

a backing having a first major surface and a second major surface; and

an abrasive coating that is free of abrasive particles, said abrasive coating consisting essentially of:

a hardened binder coating having a first surface adhered to the backing and a second structured surface

comprising a plurality of precisely-shaped protrusions; and

a diamond-like carbon coating superposed and adhered to at least a portion of the structured surface of the hardened binder coating.